REMARKS

By the present amendment, the specification and claims 1 and 17 have been amended to delete the (°) symbol in connection with values for hardness. In addition, the specification has been amended on pages 13 and 19 to clarify the method of determining hardness. Entry of these amendments is respectfully requested.

In the Office Action, it was alleged that the rejection under the first paragraph of 35 USC § 112 as contained in the initial Official Action was non-responsive. In particular, it was asserted that the specification does not describe how the hardness values are represented in that no definition was provided as to what is meant by the (°) sign. Reconsideration of this rejection in view of the above claim amendments and the following comments is respectfully requested.

As mentioned above, the specification and claims 1 and 17 have been amended to delete the (°) symbol in connection with values for hardness. This symbol apparently was included in error in the specification as originally filed.

Furthermore, the specification has been amended at pages 13 and 19 to clarify that the hardness was determined in accordance with Japanese Industrial Standard K 6253. Accompanying this Supplemental Amendment is a portion of this Standard which shows the use of a durometer of Type A as recited in the subject specification.

For the further information of the examiner, enclosed is a Conversion Chart of Rubber Hardness for various standard tests for hardness. It is to be noted that Japanese Industrial Standard A (JIS A) is a former standard used prior to 1997 and corresponds to Type A (test for normal hardness) of durometer hardness tests of JIS K 6253 discussed above. This chart allows a comparison of values from one hardness test to another including the test according to ASTM A (Shore A).

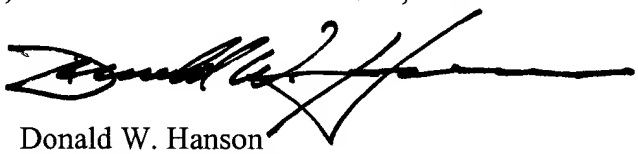
For the reasons stated above, withdrawal of the rejection under the first paragraph of under 35 U.S.C. § 112 and allowance of the application as amended are respectfully requested.

In view of the foregoing, it is submitted that the subject application is now in condition for allowance and early notice to that effect is earnestly solicited.

In the event this paper is not timely filed, the undersigned hereby petitions for an appropriate extension of time. The fee for this extension may be charged to Deposit Account No. 01-2340, along with any other additional fees which may be required with respect to this paper.

Respectfully submitted,

ARMSTRONG, WESTERMAN & HATTORI, LLP



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Enclosures: Conversion Chart of Rubber Hardness
Page 3, JIS K 6253
Marked Up Version of Amendments to Claims and Specifications

Marked Up Version of Amendments to Specification and Claims

IN THE SPECIFICATION:

Amend the specification and abstract as follows:

(Page 2, lines 2-14): However, the urethane roll disclosed in Japanese Unexamined Patent Publication No. 63-77919 has an unsatisfactory friction coefficient. That is, it is impossible to provide a sufficiently high friction coefficient which is virtually equivalent to that of the rubber roll. If the hardness of the urethane roll is reduced to lower than 40 ~~40°~~, the urethane roll has an increased adhesion, so that paper dust is liable to adhere on the surface of the roll. This disadvantageously reduces the friction coefficient. If the NCO index is reduced, the crosslinking density is reduced, thereby disadvantageously deteriorating the compression resistance and the abrasion resistance.

(Page 2, line 24 to page 3, line 9): In accordance with a first aspect of the present invention to achieve the aforesaid object, there is provided a urethane composition for a sheet transport roll, the composition comprising: (A) a polyether polyol blend containing polytetramethyleneether glycol (PTMG) and polypropylene glycol (PPG) in a weight ratio of PTMG/PPG = 99/1 to 50/50; (B) a polyisocyanate; and (C) a chain lengthening agent; the urethane composition in a cured state having a hardness of not smaller than 40 ~~40°~~, and a crosslinking density of 0.15 to 0.8 mmol/cm^3 or an allophanate bond concentration of 0.03 to 0.07 mmol/g.

(Page 13, lines 4-7): The urethane composition in a cured state is required to have a hardness of not smaller than 40 ~~40°~~, and a crosslinking density of 0.15 to 0.8 mmol/cm^3 or an allophanate bond concentration of 0.03 to 0.07 mmol/g.

(Page 13, lines 8-24): If the hardness is lower than 40 ~~40°~~, the resulting roll tends to have an increased adhesion, so that paper dust is liable to adhere onto the roll thereby reducing the friction coefficient of the roll. The hardness is measured with a load of 9.8 N by means of a durometer of type A in accordance with Japanese Industrial Standard K 6253. If the crosslinking density is smaller than 0.15 mmol/cm^3, the abrasion resistance and compression resistance of the resulting roll tend to be deteriorated. If the crosslinking density is greater than 0.8 mmol/cm^3, the resulting roll tends not to have a high friction coefficient because of its high hardness. If the allophanate bond concentration is smaller than 0.03 mmol/g, the resulting roll tends to have a reduced abrasion resistance. If the allophanate bond concentration is greater than 0.07 mmol/g, the resulting roll tends not to have a high friction coefficient because of its high hardness.

(Page 13, line 25 to page 14, line 4): It is particularly preferred that the urethane composition in the cured state has a hardness of 50 to 70 ~~50° to 70°~~, and a crosslinking density of 0.4 to 0.6 mmol/cm^3 or an allophanate bond concentration of 0.04 to 0.05 mmol/g.

(Page 19, lines 15-17): The surface hardness of each of the sheet transport rolls was measured with a load of 9.8 N by means of a durometer of Type A in accordance with Japanese Industrial Standard K 6253.

(Page 22, Table 4):

Table 4 (parts)

	Examples					
	1	2	3	4	5	6
Urethane prepolymer	100	100	100	100	100	100
(Type)	A	B	C	A	A	A
Ion conductive agent*1	-	-	-	1	-	-
Plasticizer*2	-	-	-	-	30	-
icro-capsules*3	-	-	-	-	-	3
Chain lengthening agent						
1,4-BD	3	3	3	3	3	3
TMP	2	2	2	2	2	2
~~Hardness (°)~~ Hardness	68	70	66	66	52	64
Crosslinking density(mmol/cm^3)	0.55	0.58	0.51	0.45	0.27	0.48
Initial friction coefficient	1.9	1.9	1.9	1.9	2	2
Friction coefficient after durability test	1.9	1.9	1.9	1.9	2	2
Abrasion amount (μm)	44	41	46	45	42	50
Transportation ability	○	○	○	○	○	○

*1: Lithium perchlorate
*2: DOP (dioctyl phthalate)
*3: EXPANCEL 091DE80 (average particle diameter of 80μm) available from Japan Fillite Co., Ltd.

(Page 23, Table 5):

Table 5 (parts)

	Examples			
	6	7	8	9
Urethane prepolymer	100	100	100	100
(Type)	A	A	D	E
Ion conductive agent*1	3	-	-	-
Plasticizer*2	-	50	-	-
Micro-capsules*3	-	-	-	-
Chain lengthening agent				
1,4-BD	3	3	3	3
TMP	2	2	2	2
~~Hardness (°)~~ Hardness	65	40	71	64
Crosslinking density(mmol/cm^3)	0.42	0.15	0.57	0.45
Initial friction coefficient	1.9	2	1.8	1.9
Friction coefficient after durability test	1.9	1.8	1.7	1.9
Abrasion amount (μm)	48	60	41	59
Transportation ability	○	○	○	○

*1: Lithium perchlorate
*2: DOP (dioctyl phthalate)
*3: EXPANCEL 091DE80 (average particle diameter of 80μm) available from Japan Fillite Co., Ltd.

(Page 24, Table 6):

Table 6 (parts)

	Comparative Examples					
	1	2	3	4	5	6
Urethane prepolymer	100	100	100	100	100	100
(Type)	a	b	c	d	e	f
Chain lengthening agent						
1,4-BD	3	3	2.5	3	3.5	3
TMP	2	2	2	1.5	1.5	2
~~Hardness (°)~~ Hardness	72	65	37	45	80	62
Crosslinking density(mmol/cm^3)	0.58	0.4	0.16	0.11	0.85	0.4
Initial friction coefficient	1.5	1.8	1.9	1.9	1.6	1.8
Friction coefficient after durability test	1	1.5	0.6	1.9	1.6	1.5
Abrasion amount (μm)	40	101	149	174	20	85
Transportation ability	△	×	×	×	×	△

(Page 22, Table 4):

Table 7 (parts)

	Examples					
	11	12	13	14	15	16
Urethane prepolymer	100	100	100	100	100	100
(Type)	F	G	H	F	F	F
Ion conductive agent*1	-	-	-	1	-	-
Plasticizer*2	-	-	-	-	30	-
Micro-capsules*3	-	-	-	-	-	3
Chain lengthening agent						
1,4-BD	3	3	3	3	3	3
TMP	2	2	2	2	2	2
~~Hardness (°)~~ Hardness	69	71	67	67	53	65
Crosslinking density(mmol/cm^3)	0.05	0.05	0.05	0.05	0.04	0.05
Initial friction coefficient	1.9	1.8	1.9	1.9	2	2
Friction coefficient after durability test	1.9	1.8	1.9	1.9	2	2
Abrasion amount (μm)	42	41	44	43	42	49
Transportation ability	○	○	○	○	○	○

*1: Lithium perchlorate
*2: DOP (dioctyl phthalate)
*3: EXPANCEL 091DE80 (average particle diameter of 80μm) available from Japan Fillite Co., Ltd.

(Page 28, Table 8):

Table 8 (parts)

	Examples				
	17	18	19	20	21
Urethane prepolymer	100	100	100	100	100
(Type)	F	F	I	J	F
Ion conductive agent*1	3	-	-	-	-
Plasticizer*2	-	50	-	-	-
Micro-capsules*3	-	-	-	-	-
Chain lengthening agent					
1,4-BD	3	3	3	3	2.6
TMP	2	2	2	2	1.6
~~Hardness (°)~~ Hardness	66	40	71	65	75
Allophanate bond concentration (mmol/g)	0.05	0.03	0.05	0.05	0.07
Initial friction coefficient	1.9	2	1.8	1.9	1.8
Friction coefficient after durability test	1.9	1.8	1.7	1.9	1.7
Abrasion amount (μm)	47	59	40	57	24
Transportation ability	○	○	○	○	○

*1: Lithium perchlorate
*2: DOP (dioctyl phthalate)
*3: EXPANCEL 091DE80 (average particle diameter of 80μm) available from Japan Fillite Co., Ltd.

(Page 29, Table 9):

Table 9 (parts)

	Comparative Examples					
	7	8	9	10	11	12
Urethane prepolymer	100	100	100	100	100	100
(Type)	g	h	c	d	e	i
Chain lengthening agent						
1,4-BD	3	3	2.5	3	3.5	3
TMP	2	2	2	1.5	1.5	2
~~Hardness (°)~~ Hardness	73	66	37	45	80	63
Allophanate bond concentration (mmol/g)	0.05	0.05	0	0	0.08	0.05
Initial friction coefficient	1.5	1.8	1.9	1.9	1.6	1.8
Friction coefficient after durability test	1	1.4	0.6	1.9	1.6	1.5
Abrasion amount (μm)	39	100	149	174	20	83
Transportation ability	△	×	×	×	×	△

IN THE ABSTRACT:

(Page 35, lines 2-10): A urethane composition for making a sheet transport roll, the composition comprising: (A) a polyether polyol blend containing polytetramethyleneether glycol (PTMG) and polypropylene glycol (PPG) in a weight ratio of PTMG/PPG = 99/1 to 50/50; (B) a polyisocyanate; and (C) a chain lengthening agent; the urethane composition in a cured state having a hardness of not smaller than 40 ~~40°~~, and a crosslinking density of 0.15 to 0.8 mmol/cm^3 or an allophanate bond concentration of 0.03 to 0.07 mmol/g.

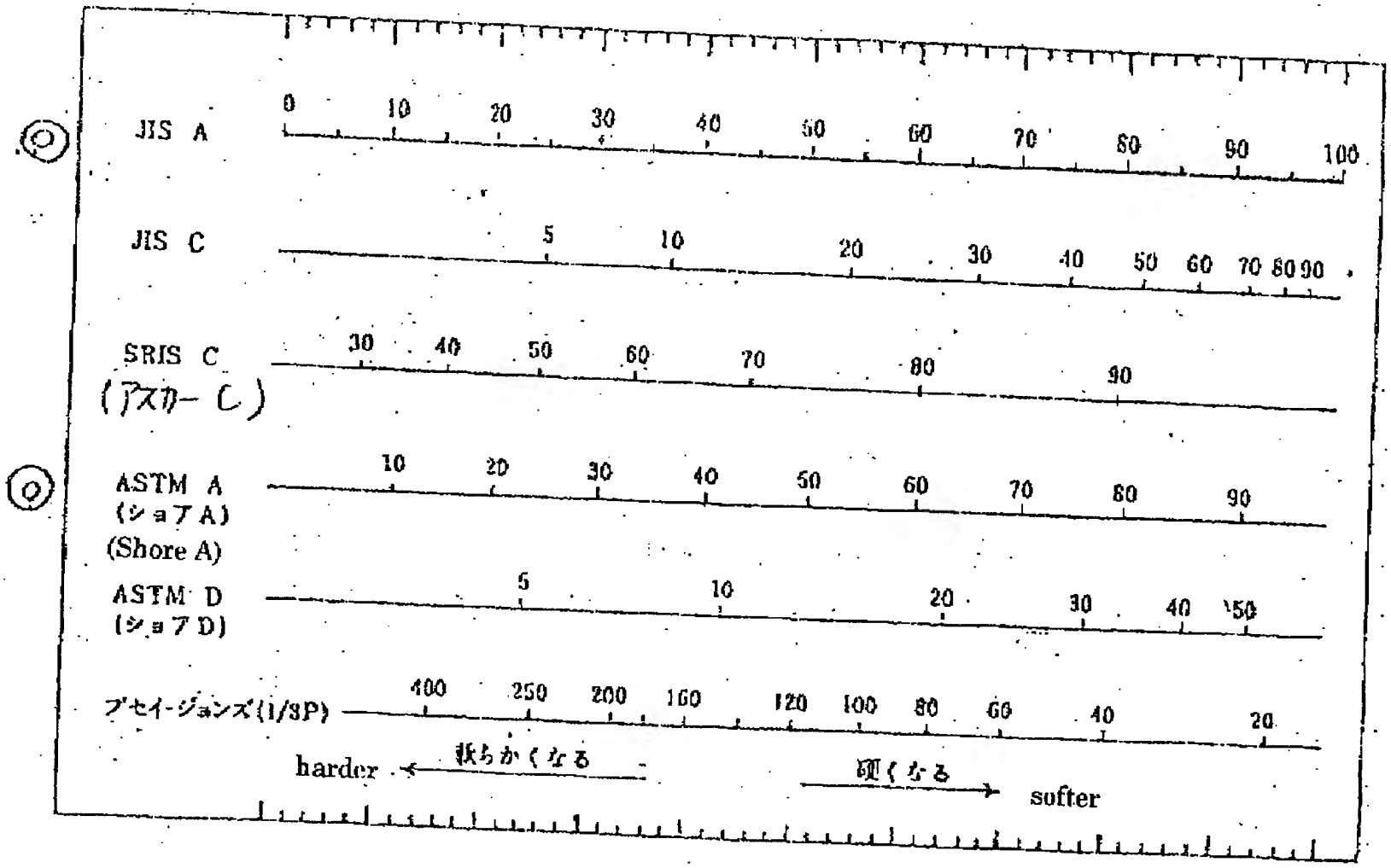
IN THE CLAIMS:

Amend the claims as follows:

1. (Amended) A urethane composition for preparing a sheet transport roll, the composition comprising: (A) a polyether polyol blend containing polytetramethyleneether glycol (PTMG) and polypropylene glycol (PPG) in a weight ratio of PTMG/PPG = 99/1 to 50/50; (B) a polyisocyanate; and (C) a chain lengthening agent, the urethane composition in a cured state having a hardness of not smaller than 40 ~~40°~~, and a crosslinking density of 0.15 to 0.8 mmol/cm^3 or an allophanate bond concentration of 0.03 to 0.07 mmol/g.

17. (Amended) A sheet transport roll comprising: a shaft; and a urethane layer provided on an outer periphery of the shaft, the urethane layer being composed of a urethane composition in a

cured state prepared from: (A) a polyether polyol blend containing polytetramethyleneether glycol (PTMG) and polypropylene glycol (PPG) in a weight ratio of PTMG/PPG = 99/1 to 50/50; (B) a polyisocyanate; and (C) a chain lengthening agent; the urethane composition in a cured state having a hardness of not smaller than 40 ~~40°~~, and a crosslinking density of 0.15 to 0.8 mmol/cm^3 or an allophanate bond concentration of 0.03 to 0.07 mmol/g.



ゴム硬さ換算図表

CONVERSION CHART OF RUBBER HARDNESS

3.2 Type of tests The type of hardness tests for vulcanized rubber shall be classified as follows.

(1) **International rubber hardness test**

(a) H method (normal size test for high hardness)

(b) N method (normal size test for normal hardness)

(c) M method (microsize test for normal hardness)

(d) L method (normal size test for low hardness)

(2) **Durometer hardness test**

(a) Type D (test for high hardness)

(b) Type A (test for normal hardness)

(c) Type E (test for low hardness)

(3) **IRHD pocket hardness test**

(a) P method (for normal hardness)

4 International rubber hardness test

4.1 Purpose This test shall be carried out to measure the international rubber hardness degree of vulcanized rubber.

4.2 Range of measurement The measuring range of this test is decided according to the thickness and hardness of a test piece for every testing method. The measuring range of each testing method is as follows.

(1) **H method** Formal measuring range shall be for the test piece measuring 8.0 mm to 10.0 mm in thickness and with hardness of 85 IRHD to 100 IRHD. It is permissible to test the one with 4.0 mm or more thickness and with hardness of 85 IRHD to 100 IRHD.

(2) **N method** Formal measuring range shall be for the test piece measuring 8.0 mm to 10.0 mm in thickness and with hardness of 35 IRHD to 85 IRHD. It is permissible to test the one with 4.0 mm or more thickness and with hardness of 30 IRHD to 95 IRHD(²).

(3) **M method** Formal measuring range shall be for the test piece measuring 1.5 mm to 2.5 mm in thickness and with hardness of 35 IRHD to 85 IRHD. It is permissible to test the one with 1.0 mm to 4.0 mm thickness and with hardness of 30 IRHD to 95 IRHD(³).

(4) **L method** Formal measuring range shall be for the test piece measuring 10.0 mm to 15.0 mm in thickness and with hardness of 10 IRHD to 35 IRHD. It is permissible to test the one with 6.0 mm or more thickness and with hardness of 10 IRHD to 35 IRHD.

Notes (²) The hardness values in 85 IRHD to 95 IRHD and 30 IRHD to 35 IRHD obtained by N method do not exactly coincide with the values by H method and L method, but the discrepancy does not come into technical problem, generally speaking.